

Claims

1. A propylene-ethylene block copolymer containing polypropylene-*b*-poly(ethylene-*co*-propylene), characterized by having a weight-average molecular weight (Mw) of the propylene-ethylene block copolymer of 100,000 or more; a poly(ethylene-*co*-propylene) segment content of not less than 5 wt.% and less than 100 wt.%; and a total ethylene content of 2-95 wt.%, wherein the propylene-ethylene block copolymer has the following characteristics (a) and (b):

(a) polypropylene segments and poly(ethylene-*co*-propylene) segments are linked chemically; and

(b) the polypropylene segments and poly(ethylene-*co*-propylene) segments are synthesized in the presence of an olefin polymerization catalyst comprising an organometallic compound and a solid catalyst component comprising either titanium and a halogen or titanium, magnesium, and a halogen.

2. The propylene-ethylene block copolymer as described in claim 1, wherein the propylene-ethylene block copolymer has a molecular weight distribution index (weight-average molecular weight (Mw) / number-average molecular weight (Mn)) of 3.5 or more.

3. The propylene-ethylene block copolymer as described in claim 1 or 2, wherein the propylene-ethylene block copolymer contains a xylene-soluble component during extraction by use of xylene at 20°C in an amount of 50 wt.% or less.

4. The propylene-ethylene block copolymer as described

in any one of claims 1 to 3, wherein the ratio of the poly(ethylene-co-propylene) segments remaining after extraction by use of xylene at 20°C to the segments before extraction is 50 wt.% or more.

(1) 5. The propylene-ethylene block copolymer as described in any one of claims 1 to 4, wherein the ratio of the total ethylene content remaining after extraction by use of xylene at 20°C to the content before extraction is 50 wt.% or more.

(1) 6. The propylene-ethylene block copolymer as described in any one of claims 1 to 5, wherein the propylene-ethylene block copolymer has an elution-completion temperature in cross-fractionation chromatography of 100-120°C.

(1) 7. The propylene-ethylene block copolymer as described in any one of claims 1 to 6, wherein the propylene-ethylene block copolymer has a melting point (T_m) of 135°C or higher.

(1) 8. The propylene-ethylene block copolymer as described in any one of claims 1 to 7, wherein the propylene-ethylene block copolymer exhibits a melt tension at 190°C of 1.0 g or more.

(1) 9. The propylene-ethylene block copolymer as described in any one of claims 1 to 8, wherein the peak temperature of complex modulus loss tangent (tan δ) based on glass transition temperature of the PP portion of the propylene-ethylene block copolymer falls within the range of -50°C to 10°C.

(1) 10. The propylene-ethylene block copolymer as described in any one of claims 1 to 9, wherein the propylene-ethylene block copolymer exhibits a storage modulus (E') at 150°C of

(0.1-30) $\times 10^7$ dyne/cm².

11. A propylene-ethylene block copolymer containing polypropylene-b-poly(ethylene-co-propylene), characterized in that the weight-average molecular weight (M_w) of the propylene-ethylene block copolymer is 100,000 or more; the poly(ethylene-co-propylene) segment content is not less than 5 wt.% and less than 100 wt.%; the total ethylene content is 2-95 wt.%; the molecular weight distribution index (weight-average molecular weight (M_w)/number-average molecular weight (M_n)) is 3.5 or more; the propylene-ethylene block copolymer contains a xylene-soluble component during extraction by use of xylene at 20°C in an amount of 50 wt.% or less; and the ratio of the poly(ethylene-co-propylene) segments remaining after extraction by use of xylene at 20°C to the segments before extraction is 50 wt.% or more.

12. The propylene-ethylene block copolymer as described in claim 11, wherein the ratio of the total ethylene content remaining after extraction by use of xylene at 20°C to the content before extraction is 50 wt.% or more.

13. The propylene-ethylene block copolymer as described in claim 11 or 12, wherein the propylene-ethylene block copolymer has an elution-completion temperature in cross-fractionation chromatography of 100-120°C.

① 14. The propylene-ethylene block copolymer as described in any one of claims 11 to 13, wherein the propylene-ethylene block copolymer has a melting point (T_m) of 135°C or higher.

① 15. The propylene-ethylene block copolymer as described

in any one of claims 11 to 14, wherein the propylene-ethylene block copolymer exhibits a melt tension at 190°C of 1.0 g or more.

(1) 16. The propylene-ethylene block copolymer as described in any one of claims 11 to 15, wherein the peak temperature of complex modulus loss tangent ($\tan\delta$) based on a glass transition temperature of the PP portion of the propylene-ethylene block copolymer falls within the range of -50°C to 10°C.

(1) 17. The propylene-ethylene block copolymer as described in any one of claims 11 to 16, wherein the propylene-ethylene block copolymer exhibits a storage modulus (E') at 150°C of $(0.1-30) \times 10^7$ dyne/cm².

18. A blushing-resistant transparent polypropylene resin for molding containing polypropylene-b-poly(ethylene-co-propylene), characterized by having a poly(ethylene-co-propylene) segment content of polypropylene-b-poly(ethylene-co-propylene) of not less than 5 wt.% and less than 50 wt.% and a total ethylene content of polypropylene-b-poly(ethylene-co-propylene) of 0.25-47 wt.%, wherein the polypropylene-b-poly(ethylene-co-propylene) has the following characteristics (a) and (b):

(a) polypropylene segments and poly(ethylene-co-propylene) segments are linked chemically; and

(b) the polypropylene segments are synthesized in the presence of an olefin polymerization catalyst comprising an organometallic compound and a solid catalyst component

comprising either titanium and a halogen or titanium, magnesium, and a halogen, and subsequently, the poly(ethylene-co-propylene) segments are synthesized.

19. The blushing-resistant transparent polypropylene resin for molding as described in claim 18, wherein the polypropylene-b-poly(ethylene-co-propylene) has a weight-average molecular weight (Mw) of 30,000 or more.

20. The blushing-resistant transparent polypropylene resin for molding as described in claim 18 or 19, wherein the polypropylene-b-poly(ethylene-co-propylene) has a molecular weight distribution index (weight-average molecular weight (Mw)/number-average molecular weight (Mn)) of 3.5 or more.

① 21. The blushing-resistant transparent polypropylene resin for molding as described in any one of claims 18 to 20, wherein the polypropylene-b-poly(ethylene-co-propylene) contains a component soluble in xylene at 20°C in an amount of 50 wt.% or less.

① 22. The blushing-resistant transparent polypropylene resin for molding as described in any one of claims 18 to 21, wherein the polypropylene-b-poly(ethylene-co-propylene) has a melting point (Tm) of 135°C or higher.

① 23. The blushing-resistant transparent molded article formed by molding a blushing-resistant transparent polypropylene resin for molding as recited in any one of claims 18 to 22.

① 24. The blushing-resistant molded article as described in claims 23, wherein molding is carried out through

injection molding.

25. An elastomer for molding containing polypropylene-b-poly(ethylene-co-propylene), characterized by having a poly(ethylene-co-propylene) segment content of polypropylene-b-poly(ethylene-co-propylene) of 50-95 wt.% and a total ethylene content of polypropylene-b-poly(ethylene-co-propylene) of 2.5-95 wt.%, wherein the polypropylene-b-poly(ethylene-co-propylene) has the following characteristics (a) and (b):

(a) polypropylene segments and poly(ethylene-co-propylene) segments are linked chemically; and

(b) the polypropylene segments are synthesized in the presence of an olefin polymerization catalyst comprising an organometallic compound and a solid catalyst component comprising either titanium and a halogen or titanium, magnesium, and a halogen, and subsequently, the poly(ethylene-co-propylene) segments are synthesized.

26. The elastomer for molding as described in claim 25, wherein the polypropylene-b-poly(ethylene-co-propylene) has a weight-average molecular weight (Mw) of 30,000 or more.

27. The elastomer for molding as described in claim 25 or 26, wherein the polypropylene-b-poly(ethylene-co-propylene) has a molecular weight distribution index (weight-average molecular weight (Mw)/number-average molecular weight (Mn)) of 3.5 or more.

① 28. The elastomer for molding as described in any one of claims 25 to 27, wherein the polypropylene-b-

poly(ethylene-co-propylene) contains a component soluble in xylene at 20°C in an amount of 50 wt.% or less.

① 29. The elastomer for molding as described in any one of claims 25-28, wherein the polypropylene-b-poly(ethylene-co-propylene) has a melting point (T_m) of 135°C or higher.

① 30. The elastomer-molded article formed by molding an elastomer for molding as recited in any one of claims 25 to 29.

① 31. The elastomer-molded article as described in claim 30, wherein molding is carried out through injection molding.